

IN THE CLAIMS:

Cancel claims 20 to 44 and add the following claims:

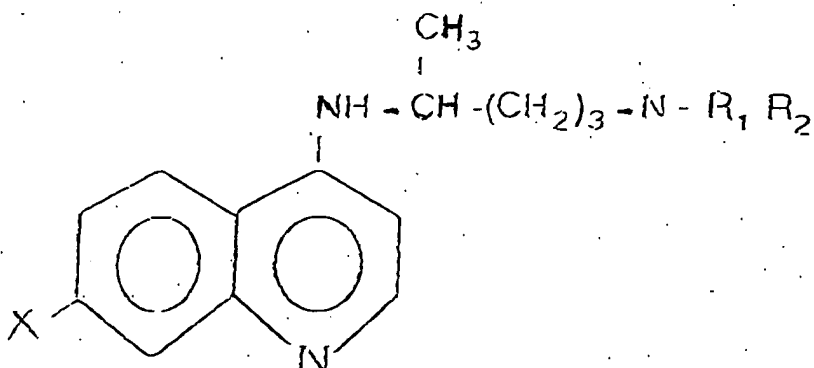
145-60. A complex comprised of at least one negatively charged nucleic acid and at least one positively charged polymeric conjugate with the bond therebetween being electrostatic in nature, the polymeric conjugate containing a polylysine formed from monomers having free NH_3^+ groups,

at least 10% of free NH_3^+ groups of the said polylysine are substituted by residues which ^{are} ~~can be~~ protonated in a weakly acid medium causing destabilization of cell membranes,

and optionally at least one free NH_3^+ group of the said polylysine is substituted by a molecule with a recognition signal recognized by a cell membrane receptor,

with the proviso that all the free NH_3^+ groups of the said polylysine make up at least 30% of the number of monomers of the skeleton of the polymeric conjugate,

wherein said residues causing destabilization of cell membrane in a weakly acid medium belong to the family of quinolines of the formula:



in which R_1 is hydrogen, R_2 is $-(CH_2)_n-CO_2-H$, X is hydrogen or chlorine and n is an integer from 1 to 10, wherein said recognition signal is selected from the group consisting of:

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a) simple osides selected from the group consisting of α or β conformers of 2-deoxy, 2-amino or 2-deoxy, 2-acetamido neutral monosaccharides; α or β conformers of glycuronic acid derivatives of neutral monosaccharides; α or β conformers of L-iduronic acid, of keto-deoxy-octonic acid, of N-acetyl neuraminic acid, or of N-glycoloyl-neuraminic acid; and α or β conformers of neutral 6-deoxy monosaccharides;

b) a disaccharide selected from the group consisting of lactose and mannopyranosyl α -6-mannopyranose,

c) complex osides selected from the group consisting of Lewis^a, Lewis^b, Lewis^c, oligomannosides and oligolactosamines and

d) peptides.

Rule 126
Claim 61. The complex of claim 60 wherein said quinolines are selected from the group consisting of 7-chloro-4-(amino-1-methylbutylamino)-quinoline, N^4 -(7-chloro-4-quinolinyl)-1,4-pentanediamine, 8-(4-amino-1-methylbutylamino)-6-methoxyquinoline (primaquine), N^4 -(6-methoxy-8-quinolinyl)-1,4-pentanediamine, and pyridines selected from the group consisting of nicotinic acid and quinolenic acid and pterines.

Claim 62. The complex of claim 60 wherein the free NH_3^+ groups of the polylysine are substituted with a non-charged gluconyl residue causing a reduction in the positive charge of the polymeric conjugate which facilitates salting out of the nucleic acids upon

dissociation of the complex.

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Claim 63. The complex of claim 60 wherein said recognition-signal is a peptide chosen from the group consisting of

(a) anti-inflammatory peptides recognized by receptors of the vascular wall,

(b) ligand peptides of integrins,

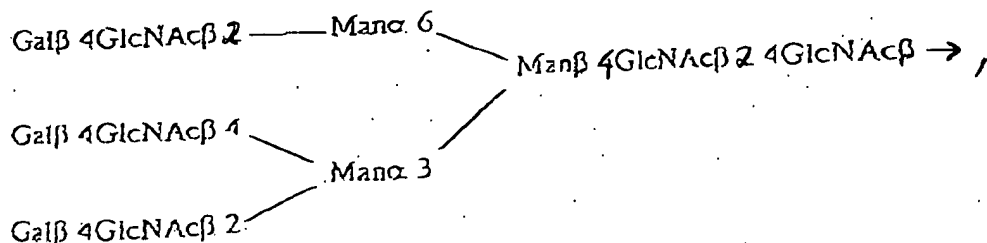
(c) chemiotactic factors and

(d) peptide hormones.

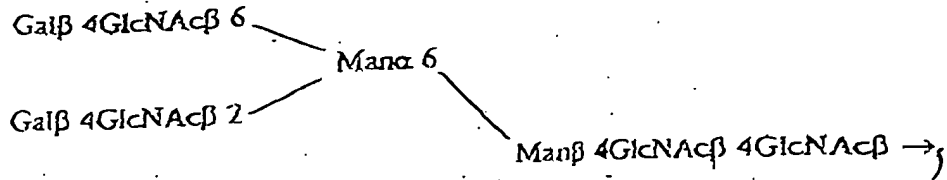
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Claim 64. The complex of claim 60 wherein:

G - the monosaccharide ^{are} ~~is~~ selected from the group consisting of galactose, mannose, fucose, glucose, ribose, xylose and rhamnose and

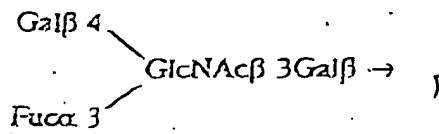
Complex Osides are
G - the ~~oligosaccharide is~~ selected from the group consisting of
(a) Asialo-oligoside of the type of triantennar lactosamine of



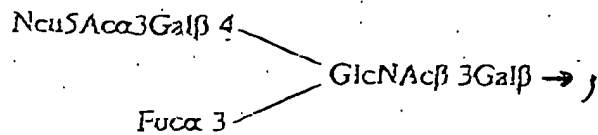
(b) Asialo-oligoside of the type of tetraantennar lactosamin
of the formula



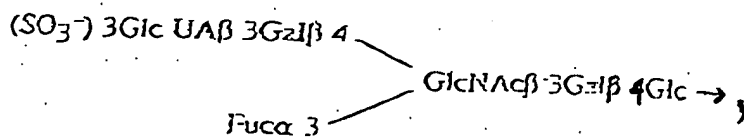
(c) Lewis x of the formula



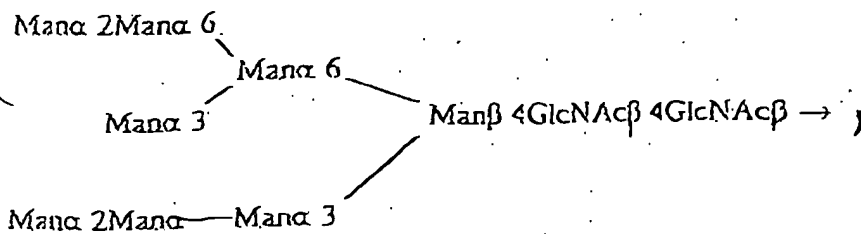
(d) Lewis x sialyl of the formula



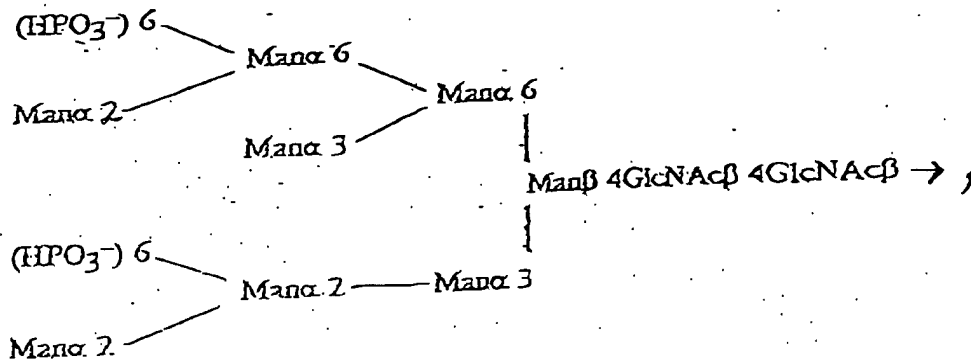
(e) Sulphated Lewis x derivative (HNK1) of the formula



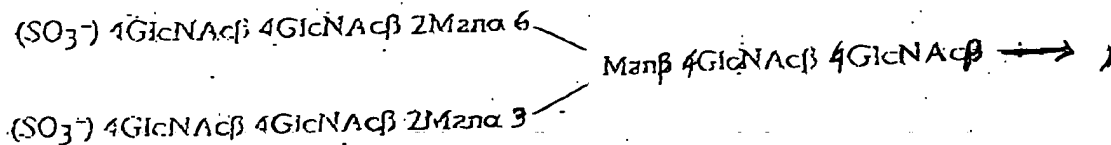
(f) Oligomannoside of the formula



(g) Phosphorylated oligomannoside



(h) Oligosaccharide of the type of sulphated lactosamine of the formula



- i. Lactose,
- j. $\text{Fuc}\alpha 2\text{Gak}\beta 3(\text{fuc}\alpha 4)\text{GlcNAc}\beta 1\text{Gal}\beta 3\text{Glc}$,
- k. $\text{Fuc}\alpha 4(\text{Gal}\beta 3)\text{GlcNAc}\beta 3\text{Gal}\beta$ and
- l. $\text{Man}\alpha 6\text{-man}$.

Claim 55. The complex of claim 54 wherein the peptides are selected from the group consisting of

- vasodilator intestinal polypeptide (VIP)
- HSDAVFTDNYTRLRKQMAVKKYLNSILN-NH₂ (SEQ ID No: 2)
- atrial natriuretic polypeptide (ANP).

SLRRSSCFGGRMDRIGAQSGLGCNSFRY (SEQ ID No: 3)

- lipocortin

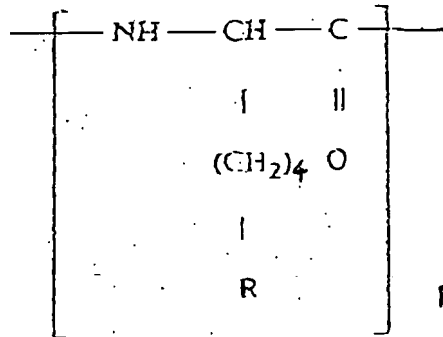
HDMNKVLDL (SEQ ID No: 4)

- bradykinin

RPPGFSPER (SEQ IS No: 5);

peptides of integrins, peptide hormones and chemotactics factors.

75/ Claim ~~66~~. The complex of claim ~~60~~ wherein the polymeric conjugate has the formula:



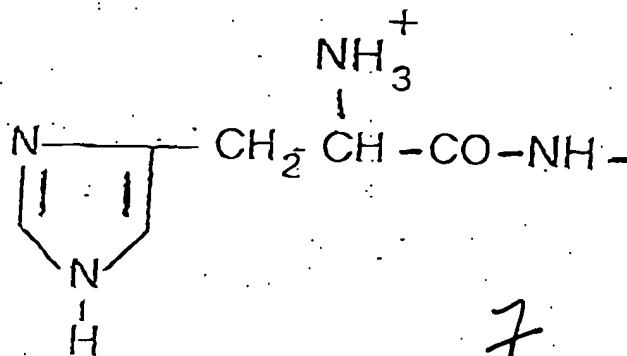
wherein:

- p is an integer from 15 to 900,
- 10 to 45% of the radical R being a residue with an imidazole nucleus,
- 10 to 90% of R being free NH_3^+ groups,
- and optionally 0 to 45% of R being $-\text{NH}-\text{CO}-(\text{CHOH})_m-\text{R}_1$, m is an integer from 2 to 15, and R_1 is hydrogen or alkyl of 1 to 15 carbon atoms.

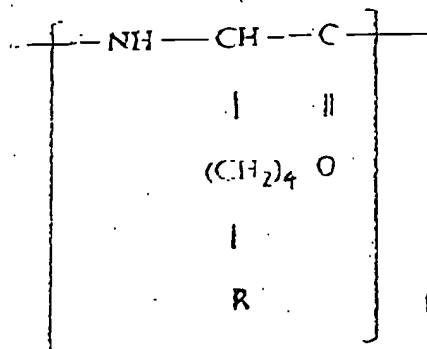
852/ ~~67~~. The complex of claim ~~66~~ wherein R is a residue with an imidazole nucleus of the formula:

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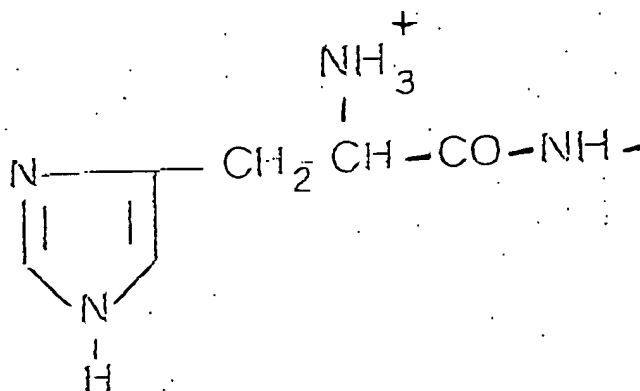


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 Claim 68. The complex of claim 51 wherein the polymeric conjugate has the following formula:



wherein:

- p is an integer from 15 to 900,
- 10% to 45% of R is a residue having an imidazole nucleus and optionally a free NH_3^+ , R has the formula:



or

- 30% to 90% of the number of R, having free NH_3^+ , and 0 to 45%

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of R are substituted by a molecule which constitutes a recognition signal by a cell membrane receptor,

with the proviso that all the free NH_3^+ functions make up at least 30% of the number of monomer units of the polymeric skeleton of the above mentioned polymeric conjugate.

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Claim 69. A complex according to claim 60 wherein the nucleic acid is selected from the group consisting of:

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a) marker genes and
b) genes ^{encoding} with a therapeutic ^{protein} purpose.

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Claim 70. Positively charged polymeric conjugate containing a polylysine formed from monomers having free NH_3^+ groups:

at least 10% of the free NH_3^+ groups of the said polylysine are substituted by residues which ^{are} ~~can be~~ protonated in a weakly acid medium causing destabilization of cell membranes,

and optionally some of the free NH_3^+ groups of the said polylysine can be substituted by a molecule with a recognition signal recognized by a cell membrane receptor,

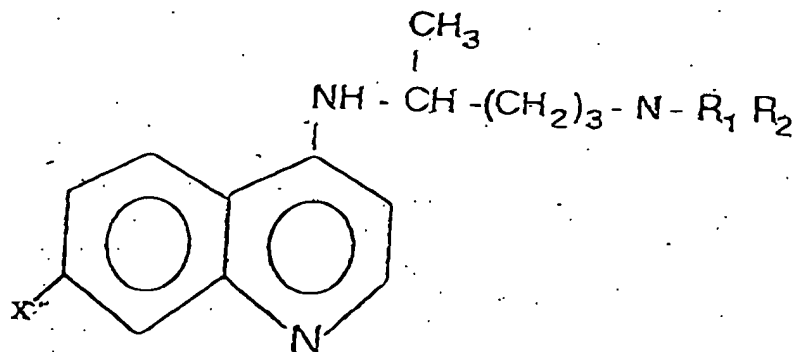
with the proviso that all the free NH_3^+ groups of the said polylysine make up at least 30% of the number of monomers of the skeleton of the polymeric conjugate,

wherein said residues causing destabilization of cell membranes in a weakly acid medium belong:

- to the family of quinolines of the formula

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F in which R_1 is hydrogen, R_2 is $(CH_2)_n-CO_2-H$, X is hydrogen or chlorine and n is an integer from 1 to 10, wherein said recognition signal is selected from the group consisting of:

- simple osides selected from the group consisting of α or β conformers of 2-deoxy, of 2-amino or of 2-deoxy, 2-acetamido neutral monosaccharides; α or β conformers of glycuronic acid derivatives of neutral monosaccharides; α or β conformers of L-iduronic acid, of keto-deoxy-octonic acid, of M-acetyl-neuraminic acid, or of N-glycoloyl-neuraminic acid; and α or β conformers of neutral 6-deoxy monosaccharides;

- a disaccharide selected from the group consisting of lactose and mannopyranosyl α -6-mannopyranose,

and complex osides selected from the group consisting of Lewis^a, Lewis^b, Lewis^c, oligomannosides and oligolactosamines, and peptides.

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Claim 71. The positively charged polymeric conjugate according to claim 70 wherein the free NH_3^+ groups of the polylysine are substituted with a non-charged residue causing a reduction in the positive charge of the polymeric conjugate which facilitates.

salting out of the nucleic acids upon dissociation of the complex,
said non-charged residue being a gluconyl.

Claim ~~72~~^{58 13}. The composition comprising the complex of claim ~~60~~⁴⁵
and an inert pharmaceutical carrier.

G Claim ~~73~~^{58 14}. A method of transfecting cultured cells comprising
incubating said cells in the presence of ~~a~~^{the} composition of claim ~~72~~^{58 13}
under conditions wherein said composition enters said cells, and
the nucleic acid comprised in the complex of said composition is
released to transfect culture cells.

F ³ Claim ~~74~~^{58 15}. The method of claim ~~73~~^{58 14} wherein the cells are
selected from the group consisting of

- cells of hematopoietic strains;
- dendritic cells;
- liver cells;
- skeletal muscle cells;
- skin cells;
- fibroblasts,
- keratinocytes,
- dendritic cells,
- melanocytes;
- cells of the vascular walls;
 endothelial;
 smooth muscle;
- epithelial cells of the respiratory tract;
- cells of the central nervous system;
- cancerous cells; and

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